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 NEWS 22  AUG 16  INPADOC: Coverage of German Patent Data resumed,
                  enhanced legal status
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 NEWS 28  SEP 26  GEOREF and ENCOMPLIT databases were reloaded on
                  September 24, 2011.
 NEWS 29  SEP 26  Updates to the IFIPAT/IFIUDB/IFICDB databases have resumed.
 NEWS 30  SEP 26  ECLA Thesaurus in CA/CAplus Improves Patent Searching on STN
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FILE LAST UPDATED: 10 Oct 2011  (20111010/ED)
REVISED CLASS FIELDS (/NCL) LAST RELOADED:  Aug 2011
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE:  Aug 2011

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=> s feedstock reformer
         26959 FEEDSTOCK
         10533 REFORMER
L1           4 FEEDSTOCK REFORMER
                 (FEEDSTOCK(W)REFORMER)

=> s feedstock and reformer
         26959 FEEDSTOCK
         10533 REFORMER
L2         386 FEEDSTOCK AND REFORMER
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=> s l2 and wood
        205736 WOOD
L3           6 L2 AND WOOD

=> s solid feedstock
       1369971 SOLID
         26959 FEEDSTOCK
L4          83 SOLID FEEDSTOCK
                 (SOLID(W)FEEDSTOCK)

=> s l4 and l2
L5           0 L4 AND L2

=> s l4 and reformer
         10533 REFORMER
L6           0 L4 AND REFORMER

=> s l4 and syngas
          8553 SYNGAS
L7          11 L4 AND SYNGAS

=> d l7 ibib abs 1-
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L7   ANSWER 1 OF 11  CAPLUS  COPYRIGHT 2011 ACS on STN
ACCESSION NUMBER:         2011:879941  CAPLUS
DOCUMENT NUMBER:          155:157304
TITLE:                    Systems and method for heating and drying solid
                          feedstock in a gasification system
INVENTOR(S):              Russell, Steven Craig; Corry, Judeth Brannon
PATENT ASSIGNEE(S):       General Electric Company, USA
SOURCE:                   PCT Int. Appl., 33pp.
                          CODEN: PIXXD2
DOCUMENT TYPE:            Patent
LANGUAGE:                 English
FAMILY ACC. NUM. COUNT:   2
PATENT INFORMATION:

     PATENT NO.          KIND   DATE       APPLICATION NO.        DATE
     ---------------     ----   --------   --------------------   --------
     WO 2011085087        A2    20110714   WO 2011-US20354        20110106
         W:  AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,
             CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG,
             ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP,
             KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA,
             MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE,
             PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV,
             SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW
         RW: AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR,
             HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS,
             SE, SI, SK, SM, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML,
             MR, NE, SN, TD, TG, BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL,
             SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
     US 20110162277       A1    20110707   US 2010-652835         20100106
PRIORITY APPLN. INFO.:                     US 2010-652835      A  20100106
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB   A system for heating and drying a quantity of coal feedstock being
     channeled to a gasifier includes a first heat exchanger coupled in flow
     communication with the gasifier for transferring heat from an input stream
     to an output stream of heat transfer fluid, and a second heat exchanger
     positioned downstream from the first heat exchanger for receiving the
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output stream of heat transfer fluid from the first heat exchanger, said second heat exchanger transfers heat from the output stream of heat transfer fluid to a stream of heating gas.

L7 ANSWER 2 OF 11 CAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2011:849231 CAPLUS
DOCUMENT NUMBER: 155:157303
TITLE: Systems and method for heating and drying solid feedstock in a gasification system
INVENTOR(S): Russell, Steven Craig; Corry, Judeth Brannon
PATENT ASSIGNEE(S): General Electric Company, USA
SOURCE: U.S. Pat. Appl. Publ., 16pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20110162277	A1	20110707	US 2010-652835	20100106
WO 2011085087	A2	20110714	WO 2011-US20354	20110106

W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW

RW: AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRIORITY APPLN. INFO.: US 2010-652835 A 20100106

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB A system for heating and drying a quantity of coal feedstock being channeled to a gasifier includes a first heat exchanger coupled in flow communication with the gasifier for transferring heat from an input stream to an output stream of heat transfer fluid, and a second heat exchanger positioned downstream from the first heat exchanger for receiving the output stream of heat transfer fluid from the first heat exchanger, said second heat exchanger transfers heat from the output stream of heat transfer fluid to a stream of heating gas.

L7 ANSWER 3 OF 11 CAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2011:815638 CAPLUS
DOCUMENT NUMBER: 155:129681
TITLE: Methods and apparatus for drying and gasification of biomass
INVENTOR(S): Winter, John D.; Jacks, Curtis J.; Tirmizi, Shakeel H.
PATENT ASSIGNEE(S): Range Fuels, Inc., USA
SOURCE: U.S. Pat. Appl. Publ., 9pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

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     US 20110155958       A1    20110630    US 2010-980317         20101228
PRIORITY APPLN. INFO.:                      US 2009-291484P     P  20091231
                                            US 2009-291502P     P  20091231
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ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB   In some variations, this invention provides a method of drying and gasifying a C-containing feedstock, comprising combusting methane to generate heat and a flue gas; drying the C-containing feedstock using part of the flue gas; and gasifying the dried feedstock to generate syngas. Some embodiments provide an apparatus for drying comprising a vessel; a primary channel for flowing the solid feedstock and a gas for drying the solid feedstock; a secondary channel for flowing the gas; and a plurality of internal screens or sieve plates suitable for passage of the gas. Other variations provide an apparatus including a primary vessel having a channel for axially flowing the solid feedstock; a pipe contained within the primary vessel, with a plurality of openings for radially distributing a gas for drying the solid feedstock; and a plurality of exit ports at the walls for removal of the gas from the primary vessel.

L7   ANSWER 4 OF 11 CAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2011:252161 CAPLUS

DOCUMENT NUMBER: 154:439671

TITLE: Evaluation of power generation schemes based on hydrogen-fueled combined cycle with carbon capture and storage (CCS)

AUTHOR(S): Cormos, Calin-Cristian

CORPORATE SOURCE: Faculty of Chemistry and Chemical Engineering, Babes-Bolyai University, Cluj-Napoca, RO-400028, Rom.

SOURCE: International Journal of Hydrogen Energy (2011), 36(5), 3726-3738
CODEN: IJHEDX; ISSN: 0360-3199

PUBLISHER: Elsevier Ltd.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB   IGCC is a power generation technol. in which the solid feedstock is partially oxidized to produce syngas. In a modified IGCC design for carbon capture, there are several technol. options which are evaluated in this paper. The first two options involve pre-combustion arrangements in which syngas is processed, either by shift conversion or chemical looping, to maximize the hydrogen level and to concentrate the carbon species as CO2. After CO2 capture by gas-liquid absorption or chemical looping, the hydrogen-rich gas is used for power generation. The third capture option is based on post-combustion arrangement using chemical absorption. Investigated coal-based IGCC case studies produce 400-500 MW net power with >90% carbon capture rate. Principal focus of the paper is concentrated on evaluation of key performance indicators for investigated carbon capture options, the influence of various gasifiers on carbon capture process, optimization of energy efficiency by heat and power integration, quality specification of captured CO2. The capture option with minimal energy penalty is based on chemical looping, followed by pre-combustion and post-combustion.

REFERENCE COUNT: 50   THERE ARE 50 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7   ANSWER 5 OF 11 CAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2011:96839 CAPLUS

TITLE: Design of a high temperature chamber fed by a plasma torch for thermal removal of tars

AUTHOR(S): Fourcault, Alice; Marias, Frederic; Michon, Ulysse

CORPORATE SOURCE: Europlasma, Bordeaux, 33520, Fr.

SOURCE: Annual North American Waste to Energy Conference, Proceedings, 17th, Chantilly, VA, United States, May

18-20, 2009 (2009), 195-203. American Society of Mechanical Engineers: New York, N. Y.
CODEN: 69NRPW; ISBN: 978-0-7918-4880-7

DOCUMENT TYPE: Conference
LANGUAGE: English

AB Biomass is one of the most important sources of renewable energy. One aim of Biomass gasification is to convert a solid feedstock into a valuable syngas for electricity or liquid fuel production Actual industrial auto-thermal gasification processes achieve a production of syngas mainly polluted by products such as dust, nitrogen oxides, sulfur dioxide and tars. Tars remain, one of the main drawbacks in using the gasification process since they are capable of condensing at low temperature This could lead to fouling, corrosion, attrition and abrasion of downstream devices such as gas turbines or engines. Tars are often removed from the syngas, decreasing the internal energy of the syngas itself. These tars are heavy aromatic hydrocarbons whose treatment remains difficult by thermal, catalytic or even phys. methods. They can condense or polymerize into more complex structures, and the mechanisms responsible for their degradation are not completely identified and understood. Turboplasma is a thermal process, proposed by Europlasma. The main principle of operation relies on the use of thermal plasma for the cracking of tars inside a syngas produced in an auto-thermal gasification step. Basically, it consists of a degradation chamber where the syngas is heated by a plasma torch. The plasma plume provides a high temperature gas (around 5000K) to the system and enables heating of the incoming stream (above 1300K) and also generates high temperature zones (above 1600K) inside the device. Due to both high temperature and long residence times of the syngas in the vessel, cracking of the tars occurs. Finally, the species released are mainly CO and H2, leading to an increase in the Lower Heating Value of the syngas. The work presented here describes the design of a high temperature gasification system assisted by thermal plasma. It was performed using a CFD computation implemented with a full chemical model for the thermal degradation of tars. The objectives were to understand the aerodynamic behavior of the vessel and to propose enhancement in its design. We present here some results of this study.

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 6 OF 11 CAPLUS

ACCESSION NUMBER: 2010:1566374 CAPLUS
DOCUMENT NUMBER: 154:32413
TITLE: Method of using syngas cooling to heat drying gas for a dry feed system
INVENTOR(S): Russell, Steven Craig; Corry, Judeth Brannon; Frey, Geroge Frederick; Mishra, Sunil Ramabhilakh; Mall, Omprakash
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 20pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20100313442	A1	20101216	US 2009-483314	20090612
CA 2705645	A1	20101212	CA 2010-2705645	20100527

AU 2010202283 A1 20110106 AU 2010-202283 20100602
CN 101922851 A 20101222 CN 2010-10208550 20100611
PRIORITY APPLN. INFO.: US 2009-483314 A 20090612
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB A method for improving the overall thermal efficiency of a coal power generation plant by transferring heat from a raw synthesis gas stream to solid fuel used as the primary feed to the gasifier, comprising the steps of initially cooling the syngas exhaust by transferring heat to a makeup conveyance gas feed to the dry feed preparation system, feeding a solid fuel component and a portion of the makeup gas stream into a grinding mechanism for the solid feedstock, forming a two-phase solids/gas stream comprising ground feedstock particulates and makeup gas, heating and drying the ground solid feedstock particulates to remove water, separating and removing water vapor formed in the heating and drying step, and feeding the heated and dried solids/gas stream to the gasifier.

L7 ANSWER 7 OF 11 CAPLUS COPYRIGHT 2011 ACS on STN
ACCESSION NUMBER: 2010:1105889 CAPLUS
DOCUMENT NUMBER: 153:534294
TITLE: Mathematical modeling and simulation of gasification processes with carbon capture and storage (CCS) for energy vectors poly-generation
AUTHOR(S): Maxim, Victoria; Cormos, Calin-Cristian; Cormos, Ana-Maria; Agachi, Serban
CORPORATE SOURCE: Faculty of Chemistry and Chemical Engineering, Babes - Bolyai University, Cluj - Napoca, RO-400028, Rom.
SOURCE: Computer-Aided Chemical Engineering (2010), 28(20th European Symposium on Computer Aided Process Engineering, 2010), 697-702
CODEN: CACEFH
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Gasification of solid fuels is a partial oxidation process which converse the solid feedstock into syngas which can be used in a large number of applications e.g. power generation, manufacture of various chems. and fuels (hydrogen, methanol, ammonia, fertilizers etc.). Not all of the gasification systems are suitable for energy vectors poly-generation with carbon capture and storage (CCS). This paper is proposing to evaluate various gasification technologies by math. modeling and simulation methods (especially for entrained flow types as these gasifiers are more suitable for implementing carbon capture technologies). In this paper a particular accent will be put on the selection of the most promising gasifier, as not all are appropriate for a carbon capture Integrated Gasification Combined Cycle (IGCC) applied for energy vectors poly-generation (with a particular focus on hydrogen and electricity co-production case) with Carbon Capture and Storage (CCS). For the selection of the most appropriate gasifier technologies the process were math. modeled and simulated with process flow modeling software (e.g. ChemCAD, Aspen). In the evaluation of various gasification technologies (e.g. Shell, Siemens, GE-Texaco, Conoco-Phillips etc.) a multi-criteria anal. was performed.

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)
REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 8 OF 11 CAPLUS COPYRIGHT 2011 ACS on STN
ACCESSION NUMBER: 2010:841312 CAPLUS
DOCUMENT NUMBER: 153:338438
TITLE: Evaluation of energy integration aspects for IGCC-based hydrogen and electricity co-production with

carbon capture and storage
AUTHOR(S): Cormos, Calin-Cristian
CORPORATE SOURCE: Faculty of Chemistry and Chemical Engineering, Babes - Bolyai University, Cluj - Napoca, RO-400028, Rom.
SOURCE: International Journal of Hydrogen Energy (2010), 35(14), 7485-7497
CODEN: IJHEDX; ISSN: 0360-3199
PUBLISHER: Elsevier Ltd.
DOCUMENT TYPE: Journal; General Review
LANGUAGE: English

AB A review. Integrated Gasification Combined Cycle (IGCC) is a power generation technol. in which the solid feedstock is partially oxidized with oxygen and steam to produce syngas. In a conventional IGCC design without carbon capture, the syngas is purified for dust and hydrogen sulfide removal and then sent to a Combined Cycle Gas Turbine (CCGT) for power generation. Carbon capture technologies are expected to play an important role in the coming decades for reducing the greenhouse gas emissions. In a modified IGCC design for carbon capture, the syngas is catalytically shifted to maximize the hydrogen level and to concentrate the carbon species in the form of carbon dioxide which can be later captured in a pre-combustion arrangement. After carbon dioxide capture, the hydrogen-rich syngas can be either purified in a Pressure Swing Adsorption (PSA) unit and exported to the external customers (e.g., chemical industry, PEM fuel cells) or used in a CCGT for power generation. This paper investigates the most important energy and process integration issues for hydrogen and electricity co-production scheme based on coal gasification process with carbon capture and storage (CCS). The evaluated coal-based IGCC case produces around 400 MW net electricity and has a flexible hydrogen output in the range of 0-200 MW (LHV) with a 90% carbon capture rate. The principal focus of the paper is on the evaluation of energy integration aspects so as to maximize the overall plant energy efficiency. Optimization includes heat and power integration of the main plant sub-systems (e.g., integration of steam generated in gasification island, with the requirements for syngas treatment, power generation in the combined cycle, best use of PSA tail gas in the power block, heat and power demand for acid gas removal unit, integration of air separation unit and gas turbine compressor etc.), sensitivity anal. (e.g., influence on ambient conditions).

OS.CITING REF COUNT: 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD (3 CITINGS)
REFERENCE COUNT: 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 9 OF 11 CAPLUS COPYRIGHT 2011 ACS on STN
ACCESSION NUMBER: 2009:1317033 CAPLUS
DOCUMENT NUMBER: 153:647381
TITLE: Conversion of syngas from biomass in solid oxide fuel cells
AUTHOR(S): Karl, Jurgen; Frank, Nadine; Karellas, Sotirios; Saule, Mathilde; Hohenwarter, Ulrich
CORPORATE SOURCE: Institute of Thermal Engineering, Technical University of Graz, A 8010 Graz, Austria
SOURCE: Journal of Fuel Cell Science and Technology (2009), 6(2), 021005/1-021005/6
CODEN: JFCSAU; ISSN: 1550-624X
PUBLISHER: American Society of Mechanical Engineers
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Conversion of biomass in syngas by means of indirect gasification offers the option to improve the economic situation of any fuel cell system due to lower costs for feedstock and higher power revenues in many European

countries. The coupling of an indirect gasification of biomass and residues with highly efficient solid oxide fuel cell (SOFC) systems is therefore a promising technol. for reaching economic feasibility of small decentralized combined heat and power production (CHP). The predicted efficiency of common high temperature fuel cell systems with integrated gasification of solid feedstock is usually significantly lower than the efficiency of fuel cells operated with hydrogen or methane. Addnl. system components like the gasifier as well as the gas cleaning reduce this efficiency. Hence common fuel cell systems with integrated gasification of biomass will hardly reach elec. efficiencies above 30%. An extraordinary efficient combination is achieved in case that the fuel cells waste heat is used in an indirect gasification system. A simple combination of a SOFC and an allothermal gasifier enables then elec. efficiencies above 50%. However, this system requires an innovative cooling concept for the fuel cell stack. Another significant question is the influence of impurities on the fuel cell degradation The European Research Project "BioCellus" focuses on both questions-the influence of the biogenous syngas on the fuel cells and an innovative cooling concept based on liquid metal heat pipes. First expts. showed that, in particular, higher hydrocarbons-the so-called tars-do not have any significant influence on the performance of SOFC membranes. The innovative concept of the TopCycle comprises to heat an indirect gasifier with the exhaust heat of the fuel cell by means of liquid metal heat-pipes. Internal cooling of the stack and the recirculation of waste heat increases the system efficiency significantly. This concept promises elec. efficiencies of above 50% even for small-scale systems without any combined processes.

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 10 OF 11 CAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2009:899816 CAPLUS
DOCUMENT NUMBER: 153:41381
TITLE: Assessment of hydrogen and electricity co-production schemes based on gasification process with carbon capture and storage
AUTHOR(S): Cormos, Calin-Cristian
CORPORATE SOURCE: Faculty of Chemistry and Chemical Engineering, Babes-Bolyai University, Cluj-Napoca, 400028, Rom.
SOURCE: International Journal of Hydrogen Energy (2009), 34(15), 6065-6077
CODEN: IJHEDX; ISSN: 0360-3199
PUBLISHER: Elsevier Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Through gasification, a solid feedstock is partially oxidized with oxygen and steam to produce syngas which can be used for conversion into different valuable compds. (e.g. hydrogen) or to generate power in a combined cycle gas turbine (CCGT). Integrated gasification combined cycle (IGCC) is one of power generation technologies having the highest potential for carbon capture with low penalties in efficiency and cost. This paper assesses from tech. point of view the transformation, through gasification, of coal with or without addition of renewable energy sources or solid waste into decarbonised energy vectors (power, hydrogen) simultaneous with carbon capture and storage (CCS). Investigated plant concepts produce a flexible ratio of power and hydrogen in the range of 400 MW electricity and 0-200 MW hydrogen with 90% carbon capture rate. The paper describes the methodol. to evaluate the plant performances using critical design factors like: fuel selection criteria, choice of gasification reactor, heat and power integration, flexibility anal., carbon capture and storage (CCS), H2 and CO2 quality specifications considering the use of hydrogen in transport sector (fuel cells) and carbon dioxide storage in

geol. formation or using for Enhanced Oil Recovery (EOR).

OS.CITING REF COUNT: 17 THERE ARE 17 CAPLUS RECORDS THAT CITE THIS RECORD (17 CITINGS)

REFERENCE COUNT: 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 11 OF 11 CAPLUS

ACCESSION NUMBER: 2007:280133 CAPLUS
DOCUMENT NUMBER: 148:475584

TITLE: Conversion of syngas from biomass in solid oxide fuel cells

AUTHOR(S): Karl, Juergen; Frank, Nadine; Karellas, Sotiris; Saule, Mathilde; Hohenwarter, Ulrich
CORPORATE SOURCE: Institute for Energy Systems, Technical University of Munich, Germany

SOURCE: Proceedings of the International Conference on Fuel Cell Science, Engineering, and Technology, 4th, Irvine, CA, United States, June 19-21, 2006 (2006), Volume Pt. A, 565-571. American Society of Mechanical Engineers: New York, N. Y.
CODEN: 69IZY6; ISBN: 0-7918-4247-9
DOCUMENT TYPE: Conference
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AB Conversion of biomass in syngas by means of indirect gasification offers the option to improve the economic situation of any fuel cell systems due to lower costs for feedstock and higher power revenues in many European countries. The coupling of an indirect gasification of biomass and residues with highly efficient SOFC systems is therefore a promising technol. for reaching economic feasibility of small decentralized combined heat and power production (CHP). The predicted efficiency of common high temperature fuel cell systems with integrated gasification of solid feedstock is usually significantly lower than the efficiency of fuel cells operated with H or methane. Addnl. system components like the gasifier, as well as the gas cleaning reduce this efficiency. Hence, common fuel cell systems with integrated gasification of biomass will hardly reach elec. efficiencies >30%. An extraordinary efficient combination is achieved in case that the fuel cells waste heat is used in an indirect gasification system. A simple combination of a SOFC and an allothermal gasifier enables then elec. efficiencies >50%. But this systems requires an innovative cooling concept for the fuel cell stack. Another significant question is the effect of impurities on the fuel cells degradation The European Research Project BioCellus focuses on both questions, the effect of the biogenous syngas on the fuel cells and an innovative cooling concept based on liquid metal heat pipes. First expts. showed that in particular higher hydrocarbons, the so-called tars, do not have an significant effect on the performance of SOFC membranes. The innovative concept of the TopCycle comprises to heat an indirect gasifier with the exhaust heat of the fuel cell by liquid metal heat pipes. Internal cooling of the stack and the recirculation of waste heat increases the system efficiency significantly. This concept promises elec. efficiencies of >50% even for small-scale systems without any combined processes.

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